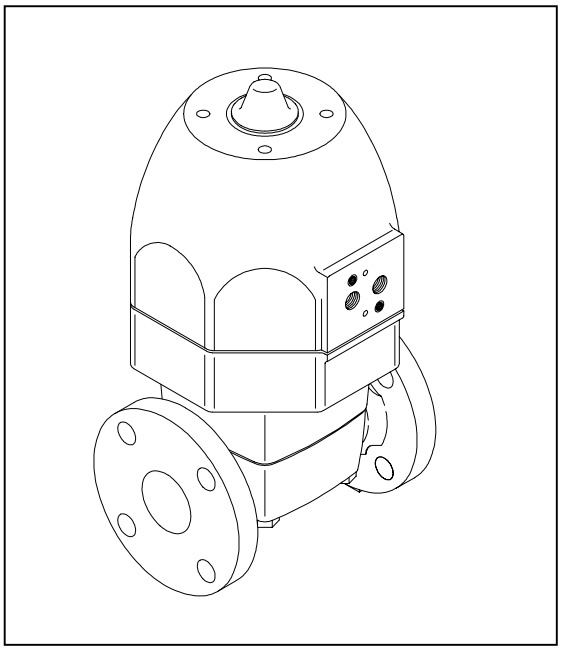
ASAHI AV Valves

| Serial No. | H – A007 E – 2 |
|---|---|

# Diaphragm Valve Type 14

## Pneumatic Model Type AN

User's Manual



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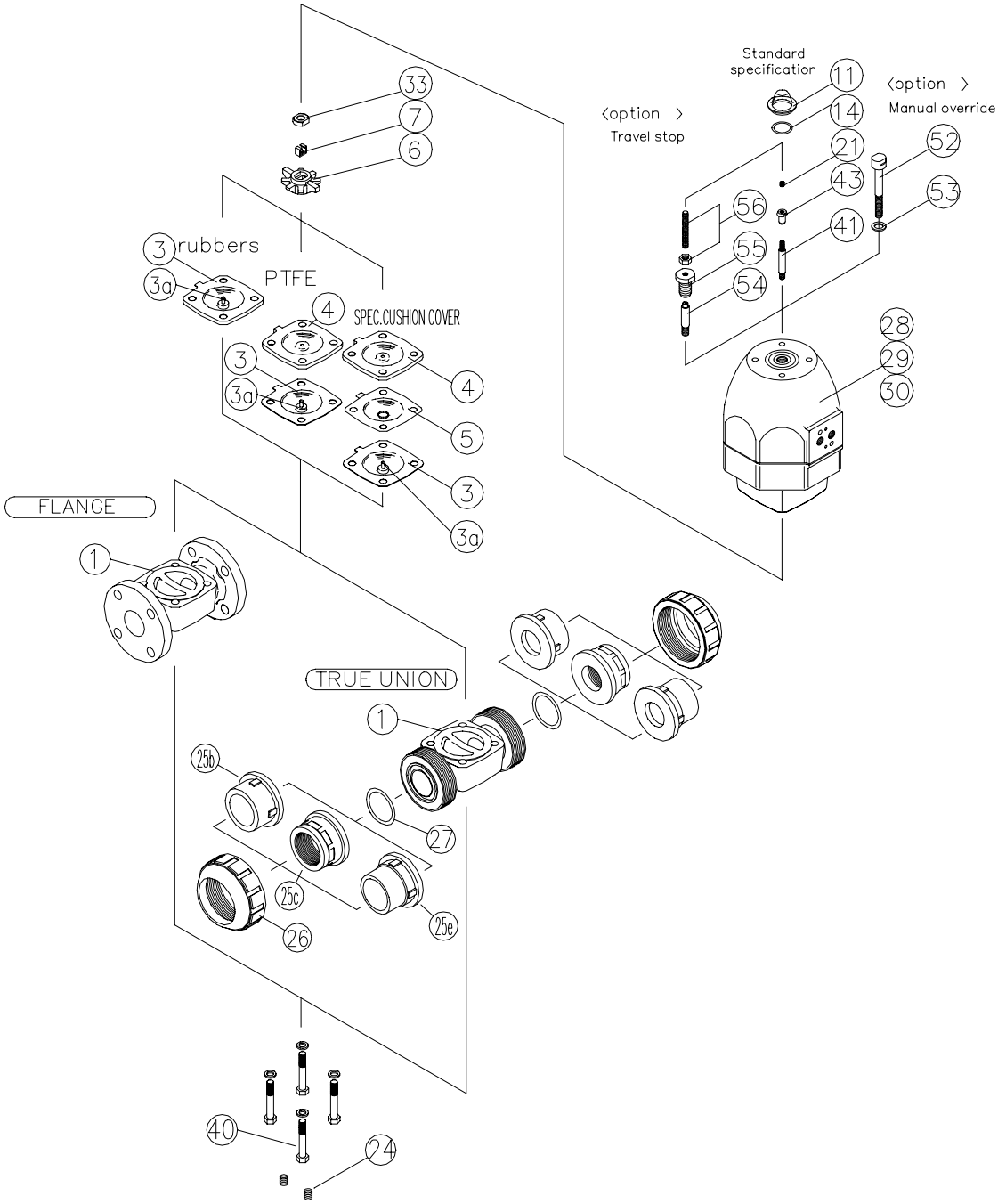
## (1) General operating instruction

- Operate the valve within the range of the published working temperature and pressure.
  （The valve can be damaged by operation beyond the maximum allowable range of temperature vs. pressure.）
- To select a valve in appropriate materials, refer to “CHEMICAL RESISTANCE ON ASAHI AV VALVE”.
  （Some chemicals give heavy damage to valve materials.）
- Bolt ㊵ torque should be checked before installation, as they may become loose after long-term storage. A periodic check of the valve condition as well as bonnet & flange bolt torque should be made part of preventative maintenance program properly re-tightening the bolts as necessary. It is especially important to re-tighten all bolts during the first shutdown, refer to installation on page 24.
- Do not disassemble the actuator. (Injury may occur.)
- The valve is not designed to bear any kind of external load. Never stand on or place anything heavy on the valve.
- Do not put added weight on the AV valve. (AV valve will break.)
- When the valve is disposed of, contact waste disposal specialist. (The valve generates toxic gas.)
- The valve should be installed at place where space for periodic inspection & maintenance is sufficient.
- Do not store or install the valve near any heat source or hot surface.
- Set valve support on the valve. (Refer to page 13)
- Keep the valve away from places of direct sunlight, water and dust. Use cover to shield the valve.
  (The valve will not operate properly.)
- Do not use AV valves in a place where they may become submerged in water.
  (Submergence will make AV valve fail.)

## (2) General instructions for transportation, unpacking and storage

- Keep the valve in its original packaging until needed for installation.
- Avoid contact with any coal tar creosote, insecticides, vermicides or paint.
  （The force of swelling may damage the valve.）
- The valve is not designed to handle any kind of impact. Avoid throwing or dropping the valve.
- Avoid scratching the valve with any sharp object.

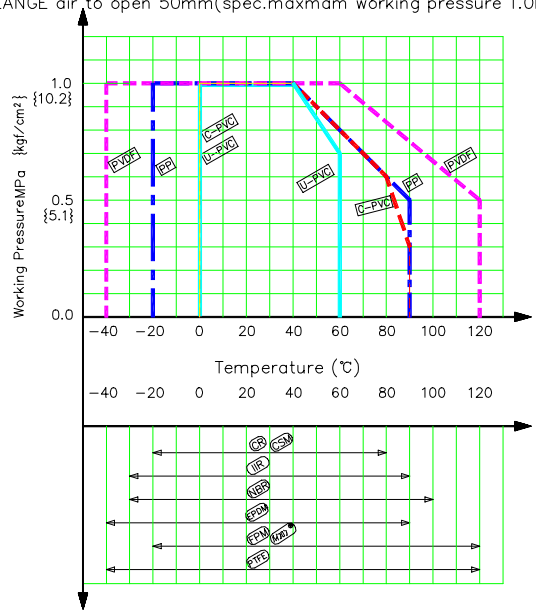
## (3) Name of parts



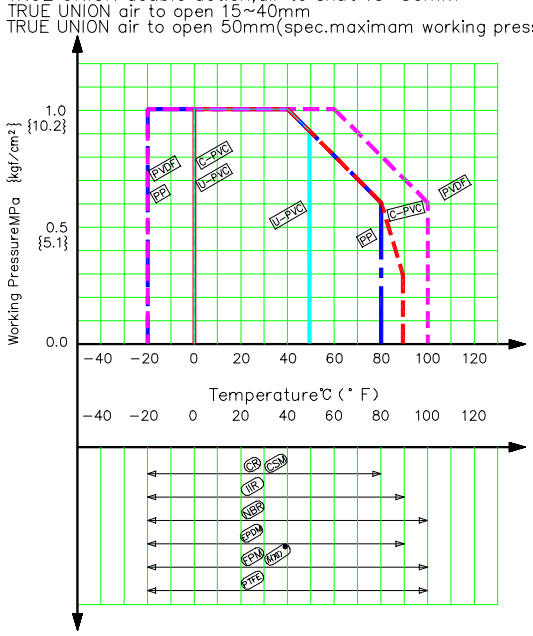

| No. | DESCRIPTION | No. | DESCRIPTION | No. | DESCRIPTION |
|---|---|---|---|---|---|
| ① | Body | ㉔ | Ensat (insert metal) | ㊵ | Bolt(B) |
| ③ | Diaphragm | ㉕b | End connector(Socket end type) | ㊶ | Indicative rod |
| ③a | Inserted metal of diaphragm | ㉕c | End connector(Threaded end type) | ㊸ | Stopper |
| ④ | Cushion | ㉕e | End connector(Spigot end type) | ㊷ | Manual shaft |
| ⑤ | Cushion cover | ㉖ | Union nut | ㊸ | Thrust ring |
| ⑥ | Compressor | ㉗ | O-ring(C) | ㊹ | Rod for travel stop |
| ⑦ | Joint | ㉘ | Actuator(double acting) | ㊺ | Fitting for travel stop |
| ⑪ | Gauge cover | ㉙ | Actuator(air to shut) | ㊻ | Bolt &nut |
| ⑭ | O-ring(A) | ㉚ | Actuator(air to open) | | |
| ㉑ | Screw | ㉝ | Compressor pushing plate | | |

## (4) Comparison between working temperature and pressure

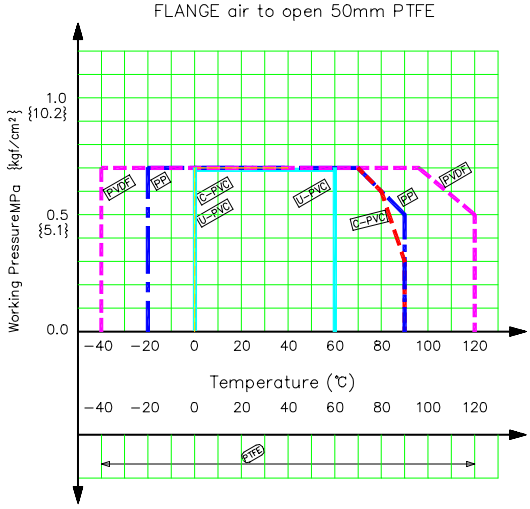
FLANGE double action,air to shut 15~50mm
FLANGE air to open 15~40mm
FLANGE air to open 50mm(spec.maxmam working pressure 1.0MPa)



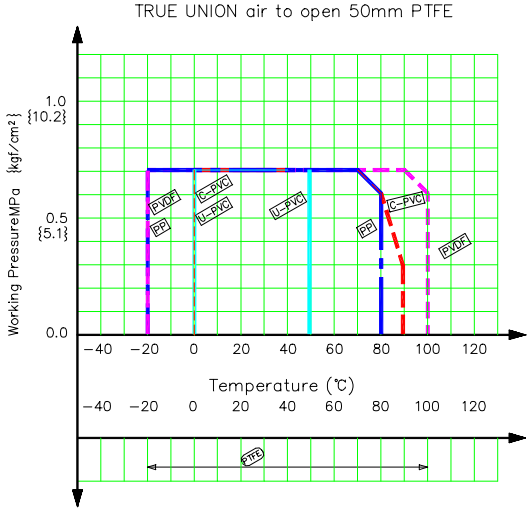

TRUE UNION double action,air to shut 15~50mm
TRUE UNION air to open 15~40mm
TRUE UNION air to open 50mm(spec.maximam working pressure 1.0MPa)



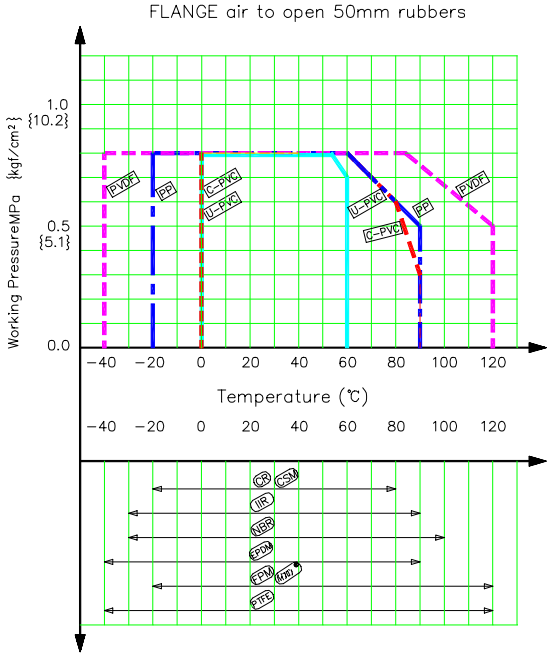

FLANGE air to open 50mm PTFE



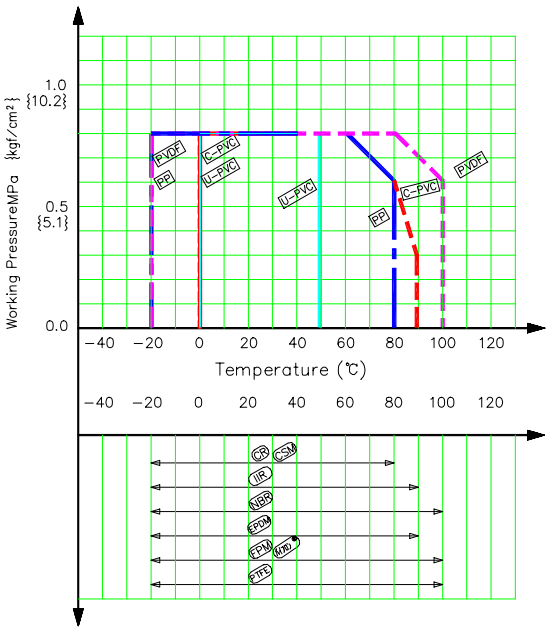

TRUE UNION air to open 50mm PTFE



FLANGE air to open 50mm rubbers




TRUE UNION air to open 50mm rubbers

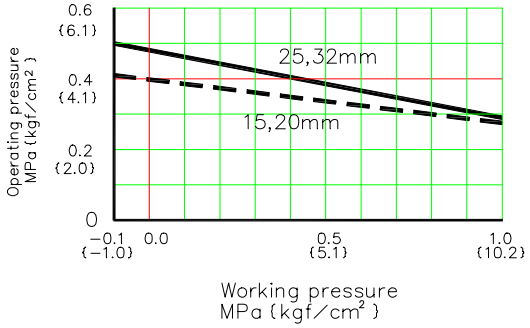


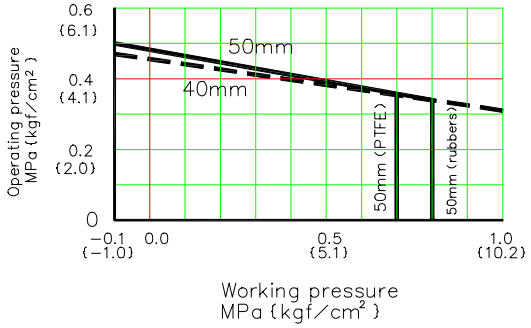

**Caution**

Do not operate the valve beyond the range of working temperature and pressure.
(The valve can be damaged.)

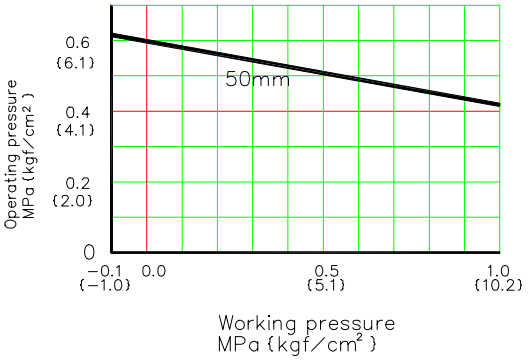
## (5) Comparison between operating pressure and working pressure and opening degree

Working pressure—Operating pressure (air to open)

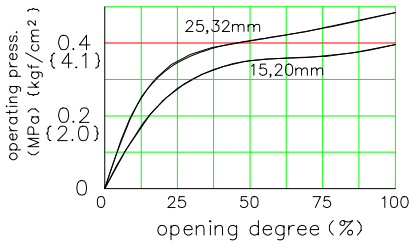


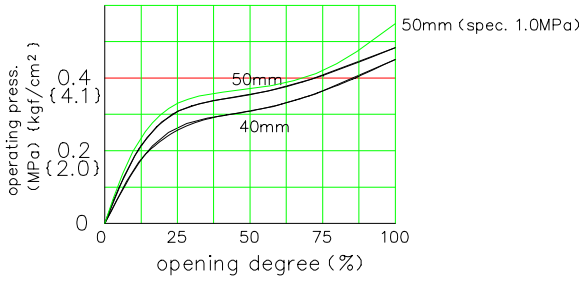




(spec.max.working pressure1.0MPa)




opening degree—operating press. (working press.0)




## (6) Specifications of Actuator

| Nominal size | | 15mm, 20mm (1/2", 3/4") | 25mm, 32mm (1", 1 1/4") | 40mm (1 1/2") | 50mm (2") |
|---|---|---|---|---|---|
| Operating pressure MPa{kgf/cm²}[PSI] | Double acting , Air to open, Air to shut | 0.4-0.6 {4.1-6.1} [57-85] | | | |
| Air consumption, Nl/per [inch³] 1 opening of closing (0.4MPa) | Double acting | 2.6 [160] | 2.7 [170] | 9.6 [590] | 9.8 [600] |
| | Air to open | 0.8 [49] | 0.8 [49] | 3.4 [210] | 3.4 [210] |
| | Air to shut | 1.8 [110] | 1.9 [120] | 6.1 [370] | 6.3 [380] |
| Air supply orifice | Double acting , Air to open, Air to shut | Rc 1/4 | | | |

## (7) Specifications of Options

(Specifications of Solenoid valve)

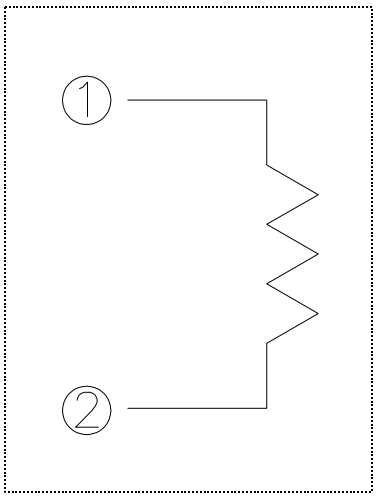
| Actuation | Nom. Size | Model No. | Pipe bore | Effective cross section area $mm^2(inch^2)$ | Power consumption | Additional function |
|---|---|---|---|---|---|---|
| All type | 15mm (1/2")- 50mm (2") | 4N3S102K-W□ -G31193 | Rc 1/4 | 10(0.016) or more | AC ; 6VA<br>DC ; 5.5W | O Bypass valve built – in<br>O Silencer with needle Valve attached<br>(to be used as speed controller) |

4N3S102K-W□-G31193

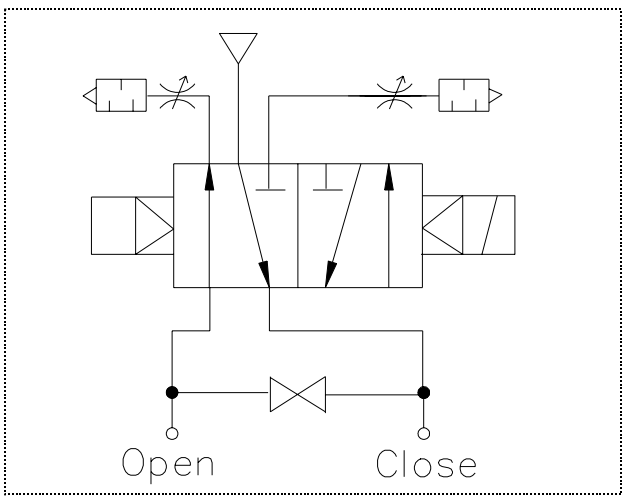
| Specification | sign |
|---|---|
| AC100V 50/60Hz | 1 |
| AC110V 50/60Hz | (2) |
| AC200V 50/60Hz | 3 |
| AC220V 50/60Hz | (4) |
| DC24V | 5 |
| DC48V | (6) |
| DC100V | (7) |
| DC125V | (9) |

* ( )is special order.

connection diagram




JIS sign



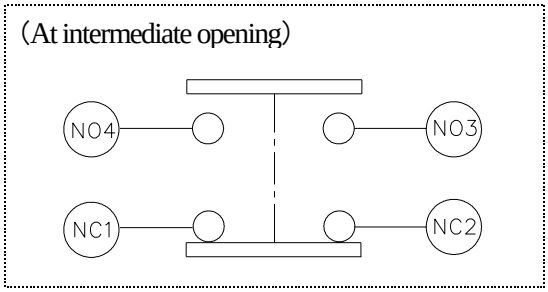
(Specifications of limit switch)

| Actuation | Nominal size | Type sign | Protection grade |
|---|---|---|---|
| Double acting , Air to open,<br>Air to shut | 15mm-50mm<br>(1/2" - 2") | 1LS19-J | Equivalent to IP55 |

Limit switch rating

| Rate voltage (V) | resistive load (A) | Inductive load (A) |
|---|---|---|
| AC125 | 11 | 7 |
| AC250 | 11 | 7 |
| DC125 | 0.5 | 0.1 |
| DC250 | 0.25 | 0.04 |

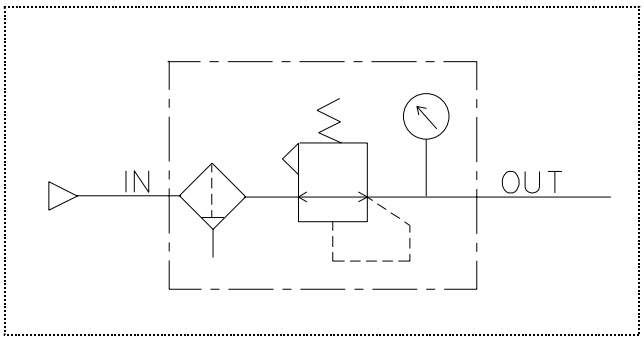
connection diagram




(Specification of pressure reducing valve with filter)

| Actuation | Nom. Size | Type sign | Pipe bore | Element degree of filtration |
|---|---|---|---|---|
| All type | 15mm-50mm<br>(1/2" - 2") | ARU2-02-8A-B | Rc 1/4 | 5 $\mu$ m |

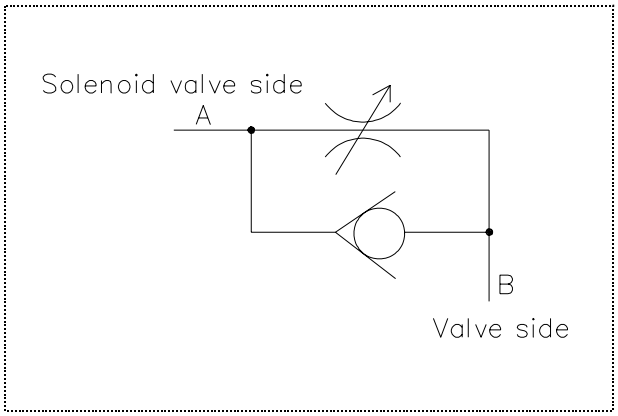
JIS sign



## (Specification of speed controller)

| Actuation | Nom. Size | Type sign | Pipe bore | Effective cross section area $mm^2(inch^2)$ | | Needle No. of revolution |
|---|---|---|---|---|---|---|
| | | | | Free flow | Control flow | |
| All type | 15mm-50mm (1/2" - 2") | SC7-08A | Rc 1/4 | 11(0.017) | 8.3(0.013) | 8 turns |

JIS sign




## (Specifications of fully open adjustment mechanism)

As to the block diaphragm and adjusting method, refer to pages 2 and 22, respectively.

## (Specifications of manual operating mechanism (set only at air to open))

As to the block diaphragm and operating method , refer to pages 2 and 23, respectively.

## (8) Installation procedure

Necessary items

- Torque wrench
- Spanner wrench
- Bolt, Nut, Washer (For many flanges specification)
- AV gasket

(When a non-AV gasket is used, a different tightening torque instruction should be followed.)

Procedure

1) Set the AV gasket between the flanges.

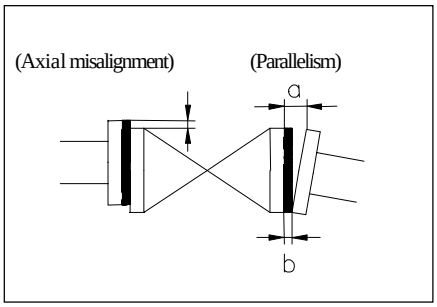
2) Insert washers and bolts from the pipe side, insert washers and nuts from the valve side, then temporarily tighten them by hand.

Caution

The parallelism and axial misalignment of the flange surface should be below the values in the following
(A failure to observe them can cause destruction due to stress application to the pipe)

Unit : mm (inch)

| Nom. Size | Axial Misalignment | Parallelism (a-b) |
|---|---|---|
| 15mm-32mm (1/2" - 1 1/4") | 1.0 (0.04) | 0.5 (0.02) |
| 40mm, 50mm (1 1/2" - 2") | 1.0 (0.04) | 0.8 (0.03) |



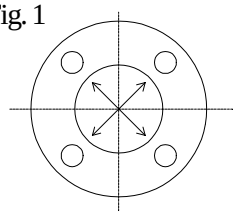

3) Using a torque wrench, tighten the bolts and nuts gradually to the specified torque in a diagonal manner. (Refer to fig.1.)

Specified torque value

Unit : N-m {kgf-cm} [lb-inch]

| Nom. Size | 15mm, 20mm (1/2", 3/4") | 25mm - 40mm (1" - 1 1/2") | 50 mm (2") |
|---|---|---|---|
| Torque value | 17.5{179}[155] | 20.0{204}[177] | 22.5{230}[200] |

Fig. 1



Caution

Avoid excessive tightening. (The valve can be damaged.)

## Threaded type (Material : PVC, C-PVC, PP, PVDF)

Necessary items

- Sealing tape（A non-sealing tape can cause leakage.）
- Strap wrench（Do not use Pipe wrench.）
- Spanner wrench

**Caution**

Make sure that threaded connections are plastic x plastic.
（Metallic thread might damage the body cap）

Procedure

1) Wind a sealing tape around the external thread of joint, leaving the end (about 3mm) free.
2) Loosen the union nut ㉖ with a strap wrench.
3) Remove the union nut ㉖ and the end connector㉕c .
4) Lead the union nut ㉖ through the pipe.
5) Tighten up the external thread of the joint and the end connector ㉕c hardly with hand.
6) Using a spanner wrench, screw in the end connector㉕c by turning 180° -360° carefully without damaging it.

**Caution**

Avoid excessive tightening. (The valve can be damaged.)

7) Make sure that the O-ring (C) ㉗ is mounted.
8) Set the end connector㉕c and union nut ㉖ directly on the body without allowing the O-ring (C) ㉗ to come off.
9) Tighten up the union nut ㉖ hardly with hand.
10) Using a strap wrench, screw it in by turning 90° - 180° carefully without damaging it.

**Caution**

Avoid excessive tightening. （The valve can be damaged）

## Socket type (Material : PVC, C-PVC)

Necessary items

- PVC or C-PVC cement (Adhesive for vinyl chloride pipes)
- Strap wrench

**Caution**

Do not install a socket type valve where the atmospheric temperature is 5 °C (23 °F) or lower.
(The valve joint can fail.)

Procedure

1) Loosen the union nut ㉖ with a strap wrench.

2) Remove the union nut ㉖ and end connector ㉕b.

3) Lead the union nut through the pipe.

4) Make sure the hub part of the end connector ㉕b is clean with waste cloth.

5) Apply adhesive evenly to the hub part of the end connector ㉕b and the pipe spigot.

**Caution**

Do not apply more adhesive than necessary.
（The valve can be damaged due to solvent cracking.）

Adhesive Quantity（guideline）

| Nom. Size | 15mm (1/2") | 20mm (3/4") | 25mm (1") | 32mm (1 1/4") | 40mm (1 1/2") | 50mm (2") |
|---|---|---|---|---|---|---|
| Quantity(g) | 1.0 | 1.3 | 2.0 | 2.4 | 3.5 | 4.8 |

6) After applying adhesive, insert the pipe quickly to the end connector ㉕b and leave it alone for at least 60 seconds.

7) Wipe away overflowing adhesive.

8) Make sure that O-ring(C) ㉗ is mounted

9) Set the end connector ㉕b and union nut ㉖ directly on the body without allowing the O-ring(C) ㉗ to come off.

10) Tighten up the union nut ㉖ hardly with hand.

11) Using a strap wrench, tighten the union nut an additional 90° - 180° carefully without damaging it.

**Caution**

Avoid excessive tightening. (The valve can be damaged.)

**Socket type** (Material : PP, PVDF )
**Spigot type** (Material : PP, PVDF)

Necessary items

- Strap wrench（Do not use the pipe wrench.）
- Sleeve welder or automatic welding machine
- User's manual for sleeve welder or automatic welding machine

Procedure

1) Loosen the union nut with a strap wrench.

2) Remove the union nut ㉖ and the end connector.

3) Lead the union nut ㉖ through the pipe.

4) For the next step, refer to the user's manual for the sleeve welder or the automatic welding machine.

5) After welding, make sure that the O-ring (C) ㉗ t is mounted.

6) Set the end connector㉕ᴅ, ㉕ᴇand the union nut ㉖ directly without allowing the O-ring (C) ㉗ to come off.

7) Tighten up the union nut ㉖ hardly with hand.

8) Using a strap wrench, tighten the union nut an additional 90° - 180° carefully without damaging it

⚠ Caution

Avoid excessive tightening. (The valve can be damaged.)

## (9) Support Setting Procedure

Necessary items

- Spanner wrench
- U-type clamp (with bolt)
- Rubber sheet

**Caution**

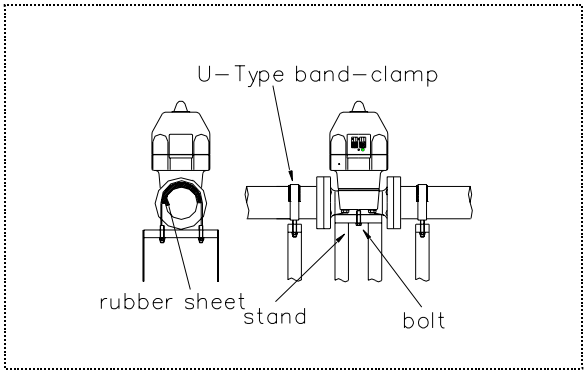
Set the valve support.
(The valve may be damaged because the actuator is heavy.)
Do not subject the valve pump vibrations.
(The valve may be damaged.)

Level plumber

○ Using metal insert(Ensert) & U-type clamp

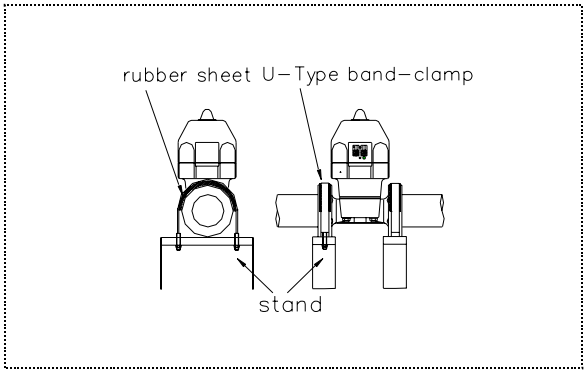
Fix the installation jig (under the valve) and stand with bolts (Refer to page 21)

Spread the rubber sheet on the pipe and secure pipe with U-type clamp.




○ Using U-type clamp (Only Flanged type)

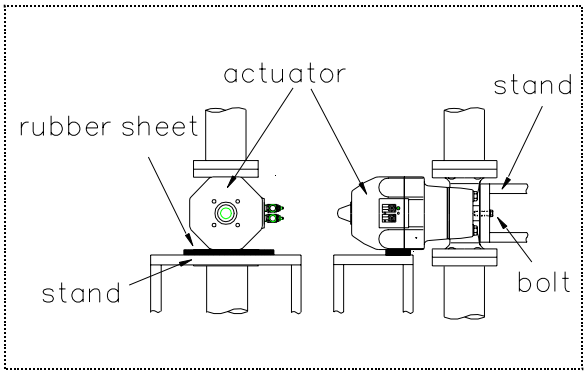
Spread the rubber sheet on the pipe and secure pipe with U-type clamp.




Perpendicular plumber

Fix the installation jig (under the valve) and stand with bolts (Refer to page 22)

Spread the rubber sheet on the pipe and secure pipe with U-type clamp.



## (10) Air Piping procedure

<1> For a standard type and an attached speed controller type

Necessary items

- Spanner wrench
- Sealing tape (If seal tape isn't used, leakage may be caused)
- Steel pipe or tube for piping
- Joint for steel pipe or tube

**Caution**

Use compressed air as operating fluid. Don't use oil pressure and water pressure.
(Actuator may be damaged.)

Use clean, filtered compressed air.
(Actuator may not work normally.)

When a steel pipe is used for piping, use the pipe the inside of which is treated to be rust preventive.
(The intrusion of rust into the actuator the electromagnetic valve may cause a malfunction.)

Don't forget to remove flash in the screw part of the joint.
(A crack and air leakage may be caused.)

Don't remove the protective plug up until piping.
(The intrusion of contaminants and water may cause the malfunction of the actuator.)

Clean the pipe by flashing before piping to prevent the malfunction of the actuator.

Procedure

1) Wind a seal tape onto the male screw of the joint with a blank about 3mm (about 2 threads) left at the end.

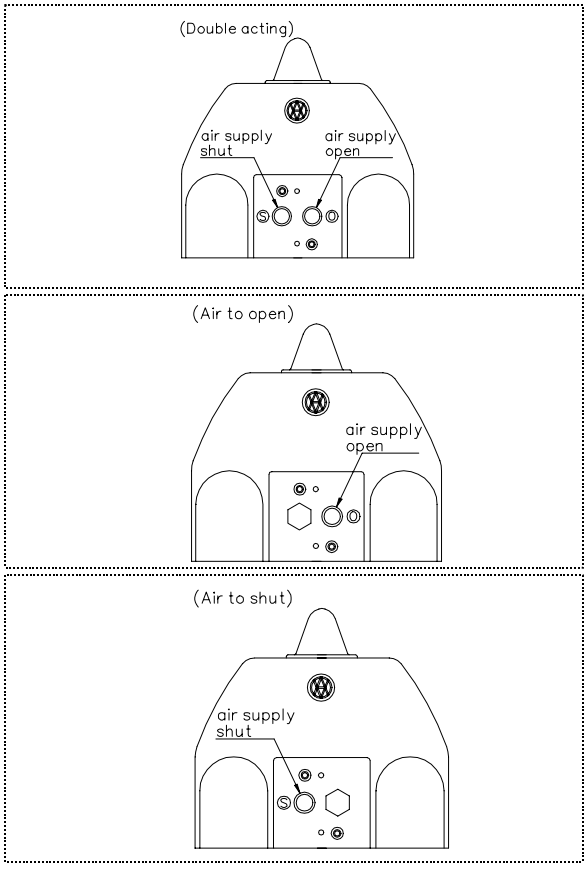
2) Screw the joint in the piping female screw of the actuator by hand fully.

3) Screw the joint one turn with a spanner wrench.

**Caution**

Avoid excessive tightening.
(The valve can be damaged.)

4) Mount a steel pipe or a tube.



<2> For a pressure reducing valve with a solenoid valve and a pressure reducing valve with a filter.

Necessary items

- Spanner wrench
- Steel pipe or tube for piping
- Sealing tape (If seal tape isn't used, leakage may be caused)
- Joint for steel pipe or tube

**Caution**

Use compressed air as operating fluid. Don't use oil pressure and water pressure.
(Actuator may be destroyed.)

Use clean, filtered compressed air.
(Actuator may not work normally.)

When a steel pipe is used for piping, use the pipe the inside of which is treated to be rust preventive.
(The intrusion of rust into the actuator the electromagnetic valve may cause a malfunction.)

Don't forget to flashing in the screw part of the joint.
(A crack and air leakage may be caused.)

Don't remove the protective plug up until piping.
(The intrusion of contaminants and water may cause the malfunction of the actuator.)

Clean the pipe by flashing before piping to prevent the malfunction of the actuator.

Procedure

1) Wind a seal tape onto the male screw of the joint with a blank about 3mm (about 2 threads) left at the end.

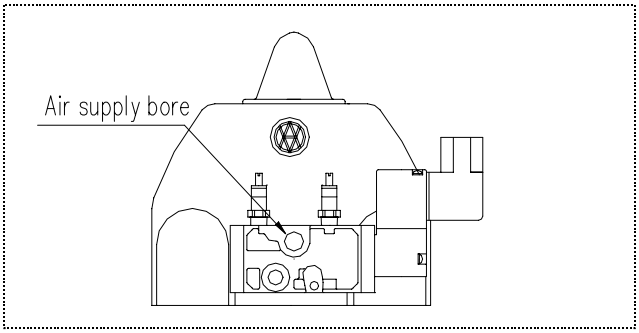
2) Screw the joint in the piping female screw of the actuator by hand fully.

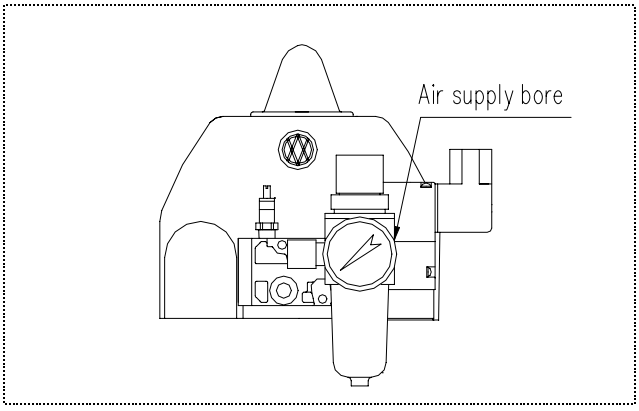
3) Screw the joint one turn with a spanner wrench.

**Caution**

Avoid excessive tightening.
(The valve can be damaged.)

4) Mount a steel pipe or a tube.



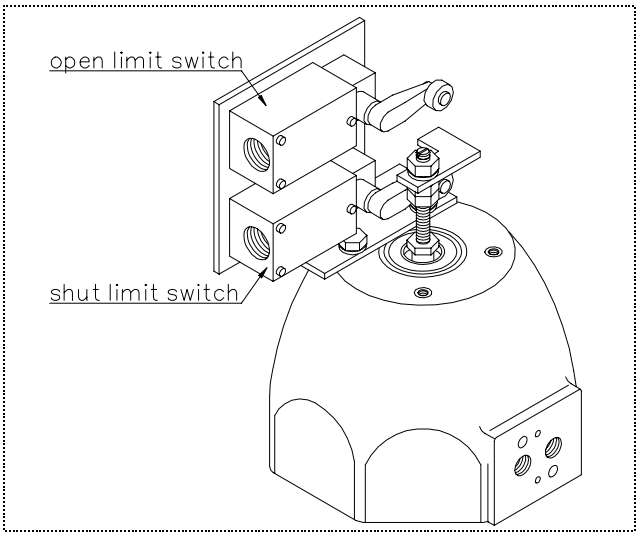



## (11) Connection of limit switch procedure

Necessary items

- Crimp-style terminal
- Phillips head screw driver
- connector (G1/2)
- Terminal crimping tool
- Wire stripper

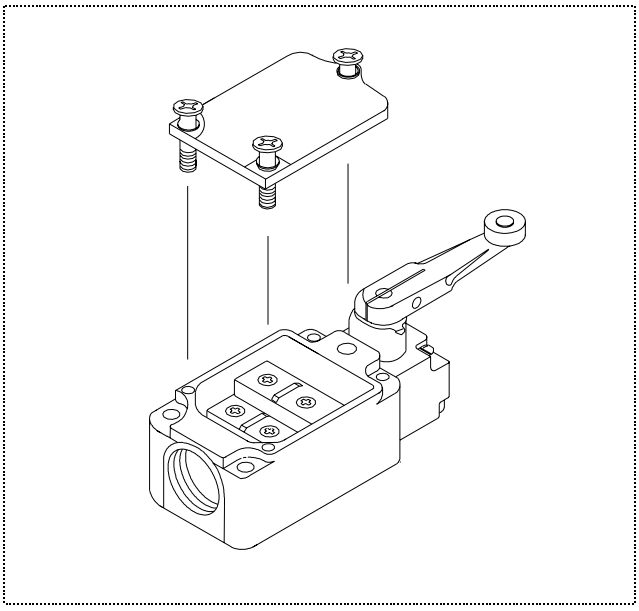
Procedure




1) Loosen the three screws used to attach the limit switch cover with a Phillips head screwdriver and remove cover from the limit switch.
   (The screw is made so that it will not detach from the cover.)
2) Pull and remove protective cap, made of resin, from the cover.
3) Draw a cable through the connector.
4) Strip cable with a wire stripper.
5) Install a crimp-style terminal on the lead wire with a terminal crimping tool.
6) Connect terminal screw with a Phillips head screwdriver according to the internal circuit diagram shown in page 7.

⚠ Caution

Tighten up the screws.
(If not, electric leaks or shocks may occur.)



7) Tighten the above three screws with a Phillips head screwdriver to install cover on the limit switch.

## (12) Connection of solenoid valve procedure

Necessary items

- Terminal crimping tool
- Connector (G1/2)
- Screw driver (+)
- Wire stripper

**Caution**

Make sure of the agreement between the power voltage indicated on the solenoid valve and the voltage wiring to be done. (Wiring with wrong voltage may cause the failure in the solenoid unit.)

Procedure

1) Loosen the hexagon socket head cap screws, and remove the cover.

**Caution**

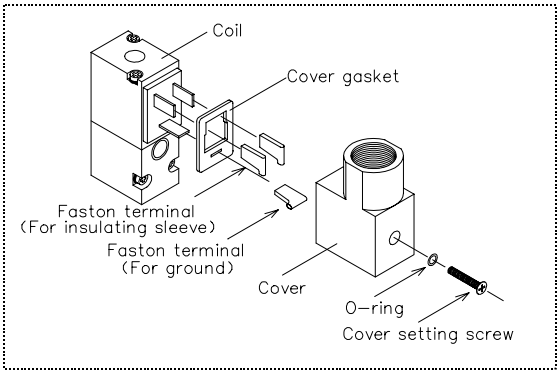
Don't loose O-ring.
(Short circuit or shocks may occur.)

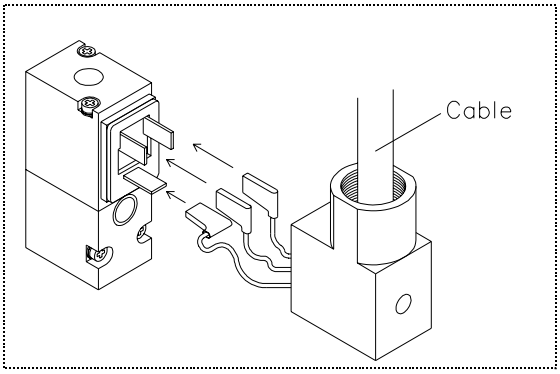
2) Remove the Fasten terminal inserted into coil side and the insulating sleeve.

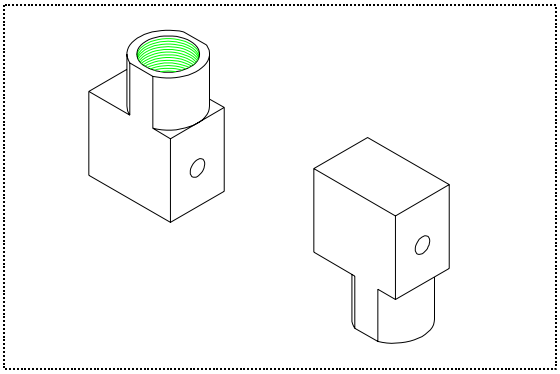
**Caution**

Insulating sleeve isn't attached in Faston terminal.

3) Draw the cable through the connector to the cover.
4) Strip the cable with wire stripper.
5) Draw the lead wire through the cover.
6) Install the Faston terminal on the lead wire with a terminal-crimping tool.
7) Insert the Faston terminal into the coil side. And fit the cover.
8) Tighten the cover setting screws to fix it.
9) (The cover can be set with the wire extraction opening turned upward or downward.)
10) Tighten the cable by connector.



## (13) Operating Procedure

Automatic (Air) Operating Procedure

**Caution**

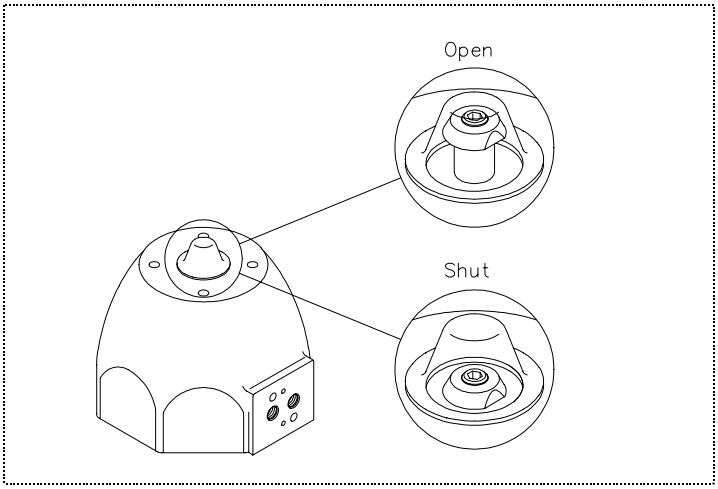
When AV valve is equipped with a solenoid valve, do not leave solenoid valve terminal cover off.
(Contact with the terminal will cause an electric shock.)
Check that the supply pressure of the pressure reducing valve with a filter is 0.4MPa{4.1kgf/cm$^2$} or more.
(AV valve may not function.)
Do not increase the set pressure of the pressure reducing valve with a filter is 0.6MPa{6.1kgf/cm$^2$} or more.
(AV valve may malfunction.)

Procedure

1) Supply air to the air supply opening.

2) Check that the air supplying side and
3) the stopper [43] position are matching.

4) Stop supplying air.




<For the solenoid valve >

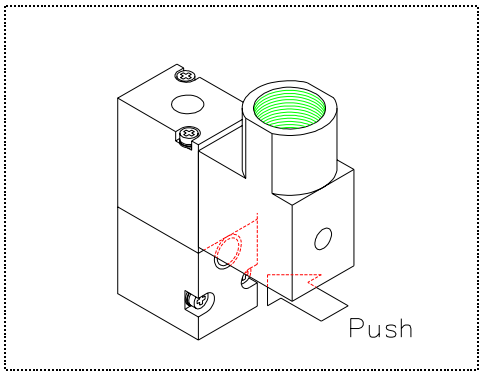
Procedure

1) Supply the air to the solenoid valve.

2) Push the button with a finger, and confirm the action mode shown in the following table.

3) Apply regular rated voltage to the solenoid valve, and confirm the action mode shown in the following table.

4) Turn off the solenoid valve




| Push button | Current | Double action | Single action | |
|---|---|---|---|---|
| | | | Air to open | Air to close |
| Pushed | On | Open | | Shut |
| Not pushed | Off | Shut | | Open |

## (14) Adjustment of opening / closing speed procedure

○ Double action type

Necessary items

● Spanner wrench

Procedure

1) Turn right the adjustment knob of the solenoid valve fully.

Caution

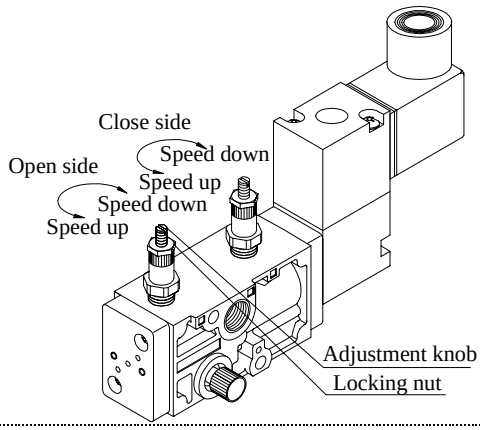
Avoid excessive tightening.
(The speed controller can be damaged.)

2) Supply the air to the solenoid valve.
3) Apply regular rated voltage to solenoid valve, and turn left the open side adjustment knob little by little.
4) Turn off the solenoid valve, and turn left the close side adjustment knob little by little.
5) Repeat item 3), 4) to adjust the opening / closing speed required.
6) When the adjustment is finished, fix the adjustment knob with locking nuts.

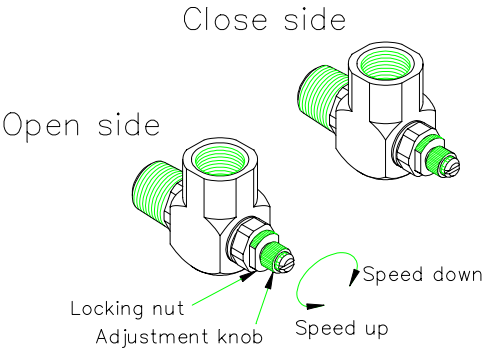
Caution

Avoid excessive tightening.
(The locking nut can be damaged.)

For Double action type with solenoid valve




For Double action type with speed controller



○ Single action type

Necessary items

● Spanner wrench

The actuation type changes the speed-adjustable direction.

| Single action | Opening speed | Closing speed |
|---|---|---|
| Air to open type | Not adjustable | Adjustable |
| Air to close type | Adjustable | Not adjustable |

Procedure

1) Turn right the adjustment knob of the solenoid valve fully.

Caution

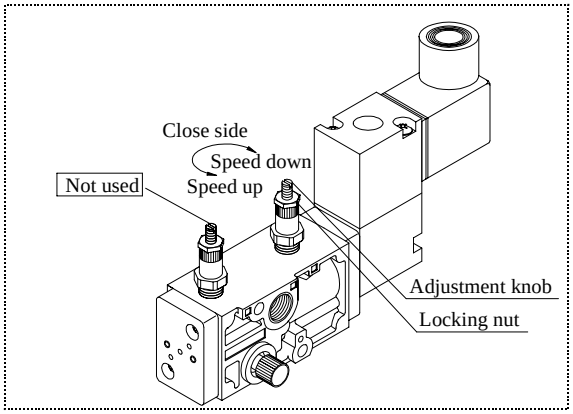
Avoid excessive tightening.
(The speed controller can be damaged.)

2) Supply the air to the solenoid valve.
3) Apply regular rated voltage to solenoid valve, and turn left the open side adjustment knob little by little.
4) Turn off the solenoid valve, and turn left the close side adjustment knob little by little.
5) Repeat item 3), 4) to adjust the opening / closing speed required.
6) When the adjustment is finished, fix the adjustment knob with locking nuts.

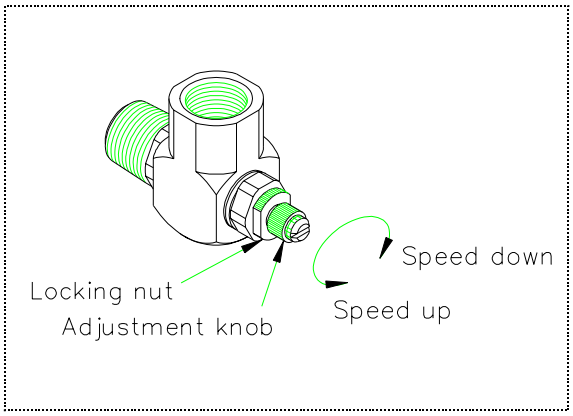
Caution

Avoid excessive tightening.
(The locking nut can be damaged.)

For Single action type with solenoid valve



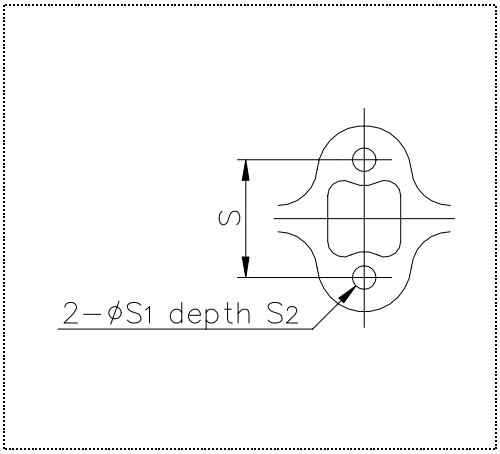

For Single action type with speed controller



## (15) Mounting Insert-metal and base (panel)

Procedure

Refer to the user's manual for the Ensat (Insert metal)
Commercially available.

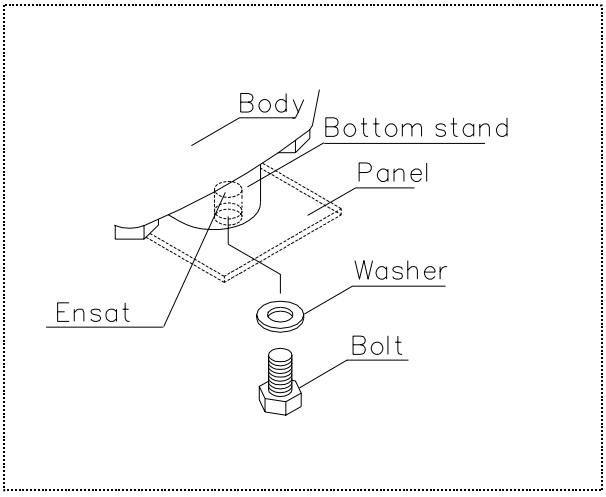


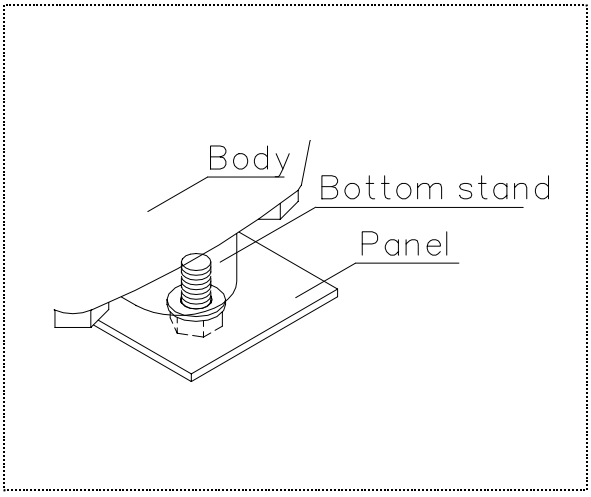

Bottom stand dimension

Unit ; mm (inch)

| Nom. Size | S1 | S2 | S3 |
|---|---|---|---|
| 15mm-32mm<br>(1/2", 1 1/4") | 25<br>(0.98) | 7<br>(0.28) | 13<br>(0.51) |
| 40mm, 50mm<br>(1 1/2", 2") | 45<br>(1.8) | 9<br>(0.35) | 15<br>(0.59) |

Panel mount procedure



## (16) Adjustment procedure for stopper

Necessary items

- Spanner wrench
- Hexagonal wrench
- Driver(Flat head screw)
- Protective Gloves
- Goggles

Procedure

1) Loosen screw with a flat head screw to remove gauge cover ⑪.

> Caution
> Do not damage O-ring (A) ⑭.

2) Fully open valve by controlling the volume of air.
3) Attach stopper ㊸ with a wrench and use a hexagonal wrench to loosen screw ㉑.
4) Turn stopper ㊸ by a 1/4,counterclockwise.
5) Attach stopper ㊸ with a wrench and use a hexagonal wrench to tighten screw ㉑.

> Caution
> Insufficient tightening may loosen the stopper.

6) Completely close valve by controlling the volume of air and check for leakage. If there is leakage, repeat steps 2) to 6) until leakage stops.
7) Install gauge cover ⑪.

(Fully open adjustment method (fully open adjustment mechanism is optional))

Necessary items

- Spanner wrench
- Hexagonal wrench
- Driver(Flat head screw)
- Protective Gloves
- Goggles

Procedure

1) Loosen screw with a flat head screw to remove gauge cover ⑪.

> Caution
> Do not damage O-ring (A) ⑲.

2) Completely close valve by controlling the volume of air.
3) Attach bolt and nut ㊺ with a hexagonal wrench, and use wrench to loosen the bolt and nut.
4) Screw bolt and nut ㊺ into requires position.
5) Attach bolt and nut ㊺ with a hexagonal wrench, and use a wrench to tighten the bolt and nut.

> Caution
> The bolt and nut may loosen if insufficiently tightened.

6) Open valve by controlling the volume of air and check valve for openness.

> Caution
> If desired degree is not reached, repeat steps 2) to 6).

7) Install gauge cover ⑪.

(Manual operating method for (Manual operating mechanism is optional only for inverse operations.))

Necessary items

- Spanner wrench
- Hexagonal wrench
- Driver(Flat head screw)

Procedure

1) Loosen screw with a flat head screw to remove gauge cover ⑪.

> Caution
> Do not damage O-ring (A)⑭.

2) Fully open valve by controlling the volume of air.

> Caution
> When it is impossible to control the volume of air due to power failure, omit step 2).

3) Attach stopper ㊸ with a wrench, and use a hexagonal wrench to loosen screw ㉑
4) Remove stopper ㊸ while turning counterclockwise.
5) Loosen screw completely with a flat head screw to remove indicative rod ㊶ from the upper portion of the actuator.
6) Shut valve completely by supplying air to it.

> Caution
> When it is impossible to supply air to the valve due to power failure, omit step 6).

7) Install thrust ring ㊸.
8) Install manual operating shaft at the same position as the indicative rod ㊶.
9) When manual shaft ㊷ is turned with a wrench clockwise, the valve will open and counterclockwise,the valve will shut.
10) Replace manual shaft ㊷ and thrust ring ㊸with stopper ㊸ screw ㉑ using the reverse procedure insteps 3 ) to 8).
11) Adjust stopper (refer to page 22).
12) Install gauge cover ⑪.

## (17) Disassembling method for replacing parts

○ Double acting and air to open

Necessary items

- Spanner wrench
- Protective gloves
- Safety goggles

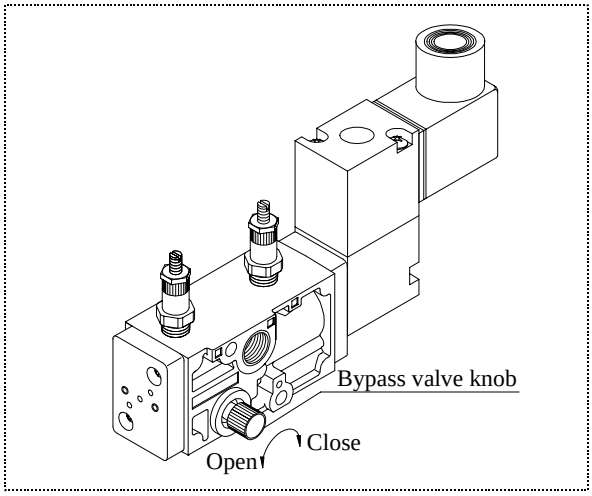
**Caution**

Wear protective gloves and safety goggles as some fluid remains in the valve.
(Injury may occur.)

(Disassemble)

Procedure

1) Completely discharge fluid from line.
2) Close main valve for air and open bypass valve to discharge air from the actuator.
3) Remove air line.
4) Loosen bolt ㊵ between the body and the actuator.
5) Remove actuator ㉘ or ㉙.
6) Remove diaphragm ③ by turning it 90 degrees.
7) Remove compressor ⑥.
8) Remove joint ⑦.




(Assembly)

Procedure

Assembly by using reverse procedures on steps 8) to 1).
(As to the body tightening torque, refer to Table 1.)

(Table 1)Body tightening torque value Unit:N-m {kgf-cm} [lb-inch]

| Diaphragm material \ Nominal size | 15mm, 20mm (1/2", 3/4") | 25mm, 32mm (1", 1 1/2") | 40mm (1 1/2") | 50mm (2") |
|---|---|---|---|---|
| Rubber | 3.0 {31} [27] | 5.0 {51} [44] | 12.0 {122} [106] | 15.0 {153} [133] |
| PTFE | 5.0 {51} [44] | 8.0 {82} [71] | 15.0 {153} [133] | 20.0 {204} [177] |

○ Air to shut

Necessary items

- Spanner wrench
- Driver(flat head screw)
- Protective gloves
- Hexagonal wrench
- Safety goggles

**Caution**

Wear protective gloves and safety goggles as some fluid remains in the valve.
(Injury may occur.)

(Disassemble)

Procedure

1) Discharge all fluid line.

**Caution**

Do not damage O-ring (A)⑲.

2) Loosen screws with flat head screw to remove gauge cover ⑪.
3) Fully open valve by controlling the volume of air.
4) Attach stopper ㊸ with a wrench, and use a hexagonal wrench to loosen screw ㉑.
5) Remove stopper ㊸ by turning counterclockwise.
6) Loosen screw completely, with flat head screw, to remove indicated rod ㊶ from the upper portion of the actuator.
7) Tighten screws with a flat head screw to install the rod ㊹ to the same position as the indicated rod ㊶.

**Caution**

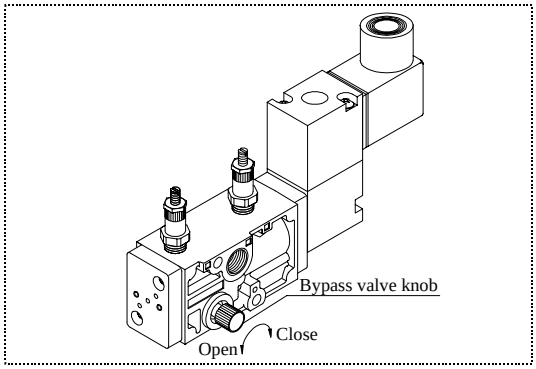
Rod for travel stop may loosen if insufficiently tightened ㊹.

8) Install indicated table ㊺ on the upper portion of actuator, and tightens by hand.
9) Put bolt and nut ㊻ in the open adjustment table and screw in using five turns or so.
10) Attach bolt and nut ㊻ with a hexagonal wrench, and use a wrench to tighten up the nut ㊻.
11) Release hexagonal wrench from the bolt and nut ㊻, and firmly install the fitting for travel stop ㊺ on the upper portion of the actuator while using a wrench to turn the nut ㊻.

**Caution**

Fitting for travel stop ㊺ may loosen if insufficiently installed.

12) Completely close valve by controlling the volume of air.
13) Adjust bolt and nut ㊻ to a completely shut position. (refer to page 23.)
14) Close main air valve and open bypass valve to discharge air from the actuator.
15) Remove air line.
16) Loosen bolt ㊵.
17) Remove actuator portion ㉚.
18) Remove diaphragm ③ by turning it 90 degrees.
19) Remove compressor ⑥.
20) Remove joint ⑦.




(Assemble)

Procedure

Assemble by using reverse procedures from steps 21) to 1).
(As to the body tightening torque, refer to Table 1 shown on page 25.)

## (18) Inspection items

○ Periodically inspect and maintain the AV valve in accordance with the plant schedule.

| Portion to be inspected | Inspection item |
|---|---|
| Actuator | 1) Existence of rust, peeling of paint, and dirt of inspection hole of valve travel indicator.<br>2) Tightening condition of respective threaded portions. (Loose or not)<br>3) Existence of rust and corrosion around the limit switch, and existence of internal disconnection.<br>4) Existence of abnormality in opening and closing operating sounds.<br>5) Smooth operation of manual handle.<br><br>* This actuator can be used without lubrication. However, if lubricating oil is used,<br>* Make sure it is compatible with the internal material.<br>Ex.: use addition turbine oil specified follow:<br>JIS K 2213 Addition Turbine oil (ISO VG 32, 46) |
| Valve | 1) Existence of scratches, cracks, deformation, and discoloring.<br>2) Existence of leakage from the valve to the outside.<br>3) Existence of leakage when the valve is opened fully at right or left.<br>4) Tightening condition of bolt (B) (loose or not) . |

## (19) Troubleshooting and action

| Problem | Cause | Action |
|---|---|---|
| The valve does not operate by air operations | The power source of the control panel is Turned off. | Turn on the power source. |
| | The solenoid valve is disconnected. | Check the connection again. (Refer to page 6) |
| | Air is not supplied to the solenoid valve. | Supply air to solenoid valve. |
| | The supply voltage to the solenoid valve is wrong. | Check voltage with a tester and set specified voltage. |
| | The voltage to the solenoid valve is low. | |
| | The bypass valve opens. | Close bypass valve by turning the bypass valve knob in a clockwise direction. |
| | The speed controller's knob is fully turned in a clockwise direction. | Turn speed controller's knob in a counterclockwise direction.(Refer to pages 19 and 20.) |
| | The operation pressure is low. | Check the operating pressure. |

| Problem | Cause | Action |
|---|---|---|
| Fluid leaks from the valve even when the valve is closed fully. | The diaphragm is worn. | Replace the diaphragm with a new one.(Refer to pages 24 and 25) |
| | The diaphragm or the body is scratched. | Replace scratched parts with new one.(Refer to pages 24 and 25) |
| | Foreign matter is in the valve. | Disassemble valve to remove foreign matter.(Refer to pages 24and 25.) |
| | The operating pressure is low. | Check the operating pressure. |
| Fluid leaks from the valve. | The bolt between the body and actuator is loose. | Tighten up the bolt to the specified torque.(Refer to page 24.) |
| | The diaphragm or the body is scratched. | Replace scratched parts with new one.(Refer to pages 24 and 25) |
| | There is foreign matter between the diaphragm and the body. | Disassemble valve to remove foreign matter.(Refer to pages 24and 25.) |
| | The union nut is loosened. | Tighten up the union nut. |
| | The O-ring is scratched or worn. | Replace the O-ring with a new one. |
| The actuator operates, but the valve does not open or close. | The diaphragm or the joint metal fitting is broken. | Replace broken parts.(Refer to pages 24 and 25.) |

## (20) Handling of residual and waste materials

⚠ Caution

In discarding remaining or waste materials, be sure to ask waste service company.
（Poisonous gas is generated.）

## (21) Inquiries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ASAHI AMERICA Inc. : 35 Green Street P.O.Box 653 , Malden, Massachusetts 02148 U.S.A.
Tel : (1) 781-321-5409 Fax : (1) 781-321-4421

# Diaphragm Valve Type 14 Pneumatic Model Type AN

[Automatic Valve]

**ASAHI ORGANIC CHEMICALS INDUSTRY CO.,LTD.**